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ABSTRACT

This paper presents an alternative analysis of tough constructions for N. Chomsky's 1981 wh-movement analysis of tough constructions. To replace Chomsky's solution and to obviate the need for generalized transformations in Government-Binding (GB) theory, an alternative analysis is proposed in which the tough subject originates as an embedded object, is subsequently reanalyzed as the complement of a derived adjective, and undergoes NP-movement to subject position. It is shown that this analysis accounts for a wide range of data, including tough constructions exhibiting wh-island effects and tough constructions containing a parasitic gap. If the solution advocated here is correct, then it must be concluded that the reintroduction of generalized transformations is simply not motivated in the case of these constructions. The implications of this new analysis are in keeping with Chomsky's own efforts to develop a maximally constrained theory of grammar and overcome M. A. Jones's 1983 objections to Chomsky's analysis. The present solution is essentially a GB version of "standard" Tough Movement Analysis and is assumed to be a typical instance of NP-movement as applied to the derived complement of a reanalyzed structure. (Contains 18 references.) (Author/NAV)

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AN NP-MOVEMENT ACCOUNT OF TOUGH CONSTRUCTIONS

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Abstract: Chomsky's (1981) wh-movement analysis of tough constructions is inadequate when tough subjects involving internal θ-relations are considered--unless, as Jones (1983) observes, generalized transformations, abandoned long ago, are now reintroduced in the Government-Binding (GB) framework. To replace Chomsky's solution and thereby to obviate the need for generalized transformations in GB theory, an alternative analysis is proposed in this paper in which the tough subject originates as an embedded object, is subsequently reanalyzed as the complement of a derived adjective, and finally undergoes NP-movement to subject position. It is shown that this analysis accounts for a wide range of data, including tough constructions exhibiting wh-island effects and tough constructions containing a parasitic gap. If the solution advocated here is correct, then it must be concluded that the reintroduction of generalized transformations is simply not motivated in the case of these constructions.

1. Introduction

Jones (1983) and Lasnik & Uriagereka (1988) have pointed out some serious problems which Chomsky's (1981) wh-movement analysis of tough constructions raises for Government-Binding (GB) theory. Unfortunately, these difficulties have gone unresolved to date; and tough phenomena still represent a major challenge to the theory. To address these problems with the intention of strengthening the credibility of GB theory, an alternative analysis of tough constructions is proposed in this paper to replace Chomsky's solution. Unlike his approach, in which the tough subject is claimed to be inserted at S-structure, this analysis provides a means by which GB theory can accommodate the 'standard' approach to deriving the subject: namely, by raising the underlying object to subject position in a process reminiscent of Rosenbaum's (1967) Tough Movement rule. The revised version of Tough Movement, now claimed to be a typical instance of NP-movement, is applied to a reanalyzed structure and raises the complement of a derived adjective to subject position. It is shown that, given certain well-motivated assumptions, this solution accounts for the two kinds of facts which Chomsky (1981, 1982) has used to motivate his wh-movement analysis: 1) tough constructions exhibiting wh-island effects and 2) tough constructions containing a parasitic gap. Moreover, this solution accounts for

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Jones's counterexamples to Chomsky's analysis with no difficulty. It is concluded, therefore, that if the solution proposed here is correct, then tough constructions need no longer be regarded as a 'problem area' for GB theory.

The organization of this paper is as follows. In Section 2 I outline Chomsky's analysis of tough constructions. In section 3 I discuss Jones's main arguments against his analysis. The remainder of this study is intended to offer a viable alternative to Chomsky's solution. I believe that the correct solution must not involve the application of wh-movement; otherwise, it will run into the same difficulties as Chomsky's analysis. Thus, some other device must be found to account for wh-island effects in tough constructions as well as tough sentences involving a parasitic gap. In section 4 I point out that such a device is already available in another part of the theory; and in Section 5 I proceed to develop a solution which utilizes this device to restrict the application of reanalysis so as to ensure that the intended first and last elements of a derived complex adjective are 'not too far apart'. Specifically, it is suggested that the rightmost element of the substring on which reanalysis operates must be 'accessible' to the leftmost element (the adjective), where 'accessibility' is defined in terms of the Subjacency Condition. This analysis accounts for wh-island effects in the complex adjective of a tough construction without involving the embedded object which is subsequently raised to matrix subject position. Section 6 deals with parasitic gaps. It is shown that, contrary to what Chomsky (1982) and others have assumed, wh-movement (that is, Movement-to-COMP) is not needed to license these gaps in tough constructions, if the embedded object undergoes Heavy NP Shift prior to reanalysis. This leaves an A'-bound trace in object position which licenses the parasitic gap in accordance with the specified environment in which these gaps can occur. In Section 7 I briefly compare this solution to the once widely accepted rule of Tough Movement. Finally, in Section 8 I discuss the implications of this analysis for GB theory, in light of the most recent efforts to achieve explanatory adequacy.

2. Chomsky's Analysis

In order to account for sentences like

(1) John is easy to please.

Chomsky (1981) proposes an analysis in which the D-structure underlying (1) contains an embedded complement clause, as in (2):

(2) e is $[_{AP}$ easy $[_{S'}$ COMP $[_{S}$ PRO to please PRO]]]

The matrix subject position in (2) is a non-θ-position (compare It is easy to please

John) and is therefore left empty at D-structure in accordance with the θ-criterion.[2] The subject of to please is in a position to which a θ-role is assigned and it is assumed to be the null element PRO. Moreover, the verb please also has an object θ-role to assign. As originally outlined in Chomsky (1977), where he observes that tough constructions exhibit wh-island effects,

(3) a. *John is easy to wonder whether to please.

b. *John is easy to persuade Mary of the need to please.

Chomsky (1981) maintains his earlier position that wh-movement is involved in the derivation of these constructions.[3] In this analysis PRO (= a null operator O) is inserted in the embedded object position at D-structure and subsequently moves to COMP leaving a coindexed trace in its original position. Thus (2) becomes (4):

(4) e is $[_{A'}$ easy $[_{S'}$ PRO_i $[_S$ PRO to please $t_i]]]$

Chomsky further assumes that (4) is subject to a rule of reanalysis, which converts the adjective-complement phrase to a complex adjective, as in (5):

(5) e is $[_{A'}$ $[_A$ easy to please] $t_i]$

John cannot fill the matrix subject position at D-structure, since, as noted above, this is a position to which no θ-role is assigned. However, if John is inserted at S-structure and, moreover, if John is coindexed with t_i, then John inherits its θ-role from t_i and thus satisfies the θ-criterion. Chomsky contends that if lexical insertion can occur freely either at D-structure or S-structure, as this analysis claims, then the theory of lexical insertion is simplified; that is, the requirement that lexical insertion takes place only at the D-structure level can now be eliminated.

3. Problems

A discussion of the problems which Chomsky's solution raises for GB theory is found in Jones (1983) (also see Lasnik & Uriagereka, 1988: 146-147). Jones's main objections on theoretical grounds involve two of Chomsky's proposals: 1) that adjectives like easy-to-please have undergone reanalysis, and 2) that lexical insertion of the matrix subject in tough constructions occurs at S-structure.[4] The effects of both proposals, Jones argues, are at variance with the theory.

Reanalysis and the Projection Principle. Consider first the effects of the reanalysis rule. Prior to reanalysis the verb please in John is easy to please obligatorily

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assigns a θ-role to its direct object; therefore, the direct object position must be filled at D-structure, as in (2), in accordance with the θ-criterion. Then, in the transformational component the Projection Principle determines that wh-movement from this position to COMP leaves a coindexed trace, given that please subcategorizes for a direct object in the lexicon.[5] Once reanalysis has applied, however, as in (5), t_i is no longer in the direct object position of please but has now become a complement of the derived adjective easy-to-please. Since please can no longer assign a θ-role to t_i after reanalysis, Jones argues, 'either we must devise some principle to ensure that derived adjectives like easy-to-please θ-mark their complements in exactly the same way as the verbs which they incorporate or we must revert to the position adopted in pre-trace EST whereby θ-roles are determined exclusively at D-structure ...' (153-4).

Lexical insertion at S-structure. According to Jones, similar problems arise with respect to Chomsky's proposal that the matrix subject of a tough construction is inserted at S-structure rather than D-structure. Recall that Chomsky adopts this approach in order to ensure that the θ-criterion is not violated at D-structure, given that the matrix subject position is a non-θ-position. However, Jones observes that the lexical subject need not be a single lexical item but rather a complex syntactic structure involving internal θ-relation:

(6) a. The reviewer of that article was easy to please.

b. The claim that John saw Mary is hard to understand.[6]

In (6a) reviewer assigns a θ-role to that article; in (6b) claim assigns a θ-role to that John saw Mary, saw assigns a θ-role to Mary, and saw Mary assigns a θ-role to John. If θ-role assignment takes place at D-structure, as Chomsky assumes, then the matrix subjects in (6) must exist at that level (Lasnik & Uriagereka 1988:147). If this is so, then Chomsky's claim that the matrix subject of a tough construction is inserted at S-structure simply cannot be maintained.

Jones also notes that the matrix subject may be a transformationally derived structure:

(7) a. The city's destruction by the enemy was painful to watch.

b. The idea that John is likely to win is difficult to believe.

The passive construction in (7a) and the raising construction in (7b) are both derived by NP-movement (an instance of Move-α). But since transformations map D-structure onto S-structure, the matrix subjects in (7) which undergo NP-movement must be present at a pretransformational level, that is, at D-structure.

Finally, Jones observes that the matrix subject itself may be moved by transformation:

(8) a. Which person do you believe is easy to please?

b. John is believed to be easy to please.

c. The idea that John is easy to please seems to be difficult to believe.

According to Jones, the sentences in (8) suggest that the tough subject is not even inserted at S-structure, as Chomsky claims, but within the transformational cycle (156).

Jones concludes that from the facts in (6-8), 'it appears that what Chomsky is advocating ... is some sort of generalized transformation, similar to those adopted in Chomsky (1957) but abandoned subsequently, which inserts a lexicalized (and possibly transformed) syntactic structure into a designated position in the matrix clause in the course of the derivation' (156). The reintroduction of such transformations, Jones contends, does not simplify any part of the theory; moreover, he argues, the reintroduction of these mechanisms does not appear to be independently motivated.

Implications. For the above reasons, Jones rejects Chomsky's analysis of tough constructions, claiming that it 'has culminated in the situation found in Chomsky (1981) where we effectively have two mutually incompatible theories coexisting within the same model' (158). Jones does not propose a solution to replace Chomsky's, nor does he appear to believe that the problems associated with Chomsky's analysis can even be resolved within the Government-Binding framework. Indeed, Jones ends his paper by suggesting that, in light of the evidence provided by tough constructions, GB theory should be replaced with a more 'comprehensive' theory of grammar (159).

In Section 5 of this study, an alternative analysis of tough constructions will be proposed in the GB framework to address Jones's objections to Chomsky's solution and to demonstrate that the theory itself need not be replaced on account of these constructions. First, however, in order to help lay the groundwork for the proposals that I will develop in Section 5, I turn briefly to the apparently unrelated topic of what constitutes an Accessible SUBJECT in binding theory. My purpose in doing this is to show that there is a device in GB theory which Chomsky (1981) introduces in his definition of Accessible SUBJECT--henceforth the would not violate (WNV) device--which, I will argue, is also needed to account for wh-island effects in tough constructions.

4. Accessible SUBJECT and the Would Not Violate Device

The notion of accessibility is a crucial factor in determining the governing category of an anaphor or a pronominal in binding theory.[7] Chomsky (1981: 211-212) defines governing category as in (9), where Accessible SUBJECT is defined as in (10):

(9) β is a governing category for α iff β is the minimal category containing α, a governor of and a SUBJECT accessible to α.

(10) β is accessible to α iff α is in the c-command domain of β and assignment to α of the index of β would not violate the filter $*[_{\gamma_i} \ldots \delta_i \ldots]$. (my emphasis)

Chomsky's key phrase 'would not violate' in (10) is afforded a particularly lucid explanation in Lasnik & Uriagereka (1988:62) (where their (117b) = (10)):

> The modality of (117b)--the word would--is important. (117b) does not claim that α and β do have the same index. It does not claim that they should. It does not even claim that it is possible for them to have the same index. It simply says, 'Pretend we found α and gave it the index of β; what would we then have?' (their emphasis)

Since this paper is not concerned with binding theory per se, I will not discuss the consequences of (9) and (10) for the treatment of anaphora. What is important for our purposes is that in his definition in (10), Chomsky introduces a device, the WNV, by which the well/ill-formedness of a derivation is determined, not by actually applying an operation (indexation, in the case of (10)), but simply by imagining that the operation has been applied and concurrently checking for any would-be violations of the relevant condition(s) (for instance, the filter in (10)).

I assume that the WNV device is not necessarily peculiar to the definition in (10) and that it may be available at other levels of the grammar--provided that it is demonstrably needed to account for some specific phenomenon. In what follows I will argue that the fact that tough constructions exhibit wh-island effects is precisely such a case.

5. Toward an Alternative Solution

Jones's strongest argument against Chomsky's analysis of tough

constructions is that it is inadequate when the sentences in (6-8) are taken into account. These sentences in fact provide convincing evidence that tough subjects are inserted at D-structure and not at S-structure, as Chomsky claims. Keeping this in mind, I now proceed to develop an alternative solution to replace Chomsky's analysis of tough constructions. In the course of this discussion, the importance of the WNV device described above will become evident.

Assumptions. To begin with, let us again consider the sentence in (1), repeated below:

(1) John is easy to please.

Following Chomsky, I assume that the matrix subject position is a non-θ-position and is therefore left empty at D-structure. However, unlike his analysis, in the present solution John (rather than PRO) is claimed to be the underlying object of please. The D-structure underlying sentence (1) in this analysis is represented in (11):

(11) e is [$_{AP}$ [$_{A}$ easy to please] John]

I further assume that Chomsky's rule of reanalysis is basically correct and that it converts the adjective-complement phrase in (11) to a complex adjective, as in (12):[8]

(12) e is [$_{AP}$ [$_{A}$ easy to please] John]

Reanalysis and the Subjacency Condition. If John is inserted in embedded object position at D-structure, as this analysis claims, then one might suggest the possibility that John moves to COMP prior to (or perhaps in lieu of) reanalysis. Such a solution would be identical to Chomsky's (at least up to this point in the derivation) except that John (rather than PRO) is the object NP that moves to COMP. In fact, there is nothing in the theory which would prevent John in (11) from moving to COMP, resulting in (13):

(13) e is [$_{AP}$ [$_{S'}$ John$_i$ [$_{S}$ PRO to please t_i]]]

However, as Chomsky (1986:113-4) observes, the subsequent movement of John from the embedded COMP to the matrix subject position results in a chain (John, e', e) in which John is the head, e' is the trace of John in COMP, and e is a variable which is A-bound by John, hence not A-free in the domain of the head of its chain, in violation of Binding Condition C. Thus, an analysis of (1) in which John first moves to COMP and then somehow ends up in the matrix subject position simply cannot be maintained in the present framework. In short, some

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way other than Movement-to-COMP must be found to account for wh-island effects in tough constructions; and in the present solution, in which (11) is reanalyzed as in (12), it appears that the answer to this problem must lie with the reanalysis rule itself.

On comparing the strings in (11) and (12), we observe that there are at least two effects of reanalysis which are evident: 1) A is extended such that it now contains all of the substring from easy up to and including please, and 2) embedded S' and its internal constituency are eliminated. We also note that the complex adjective easy-to-please is the result of incorporating three elements: the initial element (the lexical adjective), the medial element to, and the final element (the infinitive). Indeed, it appears that all complex adjectives begin with a lexical adjective and end with a (transitive) infinitive or a preposition. What varies, though, is the amount of material which may intervene between the first and last elements, as in easy-for-us-to-please, easy-to-want-to-try-to-give-flowers-to, etc. Thus, we can describe a complex adjective in terms of the three main elements which it incorporates: the initial element, the final element, and an intervening variable.

Although reanalysis is by no means a movement rule, it resembles Move-α in at least three ways. For one thing, both processes relate two positions X and Y in a string ...X...Y... such that either movement takes place from one position to the other, or, in the case of reanalysis, an adjective A is extended from the position of X up to and including Y to derive a complex adjective of the form $[_A$ X...Y]. Second, both reanalysis and Move-α involve an intervening variable between X and Y. Finally, in the same way that a constituent can move 'just so far', it turns out that the initial and final elements of a complex adjective can be 'just so far apart', the distance appearing to be measurable in terms of the bounding nodes which separate these elements at D-structure.

The fact is that not all potential final elements of a complex adjective are 'accessible' to the adjective for reanalysis. For instance, in (14),

(14) e is $[_{AP}$ easy $[_{S'}$ COMP $[_S$ PRO to warn the police $[_{PP}$ about $[_{NP}$ your plan $[_{S'}$ COMP $[_S$ PRO to rob the bank]]]]]]]

warn and about both appear to be accessible to easy for reanalysis but rob does not, as evidenced by the grammaticality of (15a-b) contrasted with (15c):

(15) a. easy-to-warn

b. easy-to-warn-the-police-about

c. *easy-to-warn-the-police-about-your-p an-to-rob

Notice that in (14) warn and about are each separated from easy by one bounding node (S), while three bounding nodes separate rob and easy (S, NP, S). One possibility, then, is that a condition might be placed on reanalysis such that A cannot be extended across more than one bounding node. Clearly, though, this condition would be way too restrictive, at least as far as reanalysis in English is concerned.[9] For instance, consider the complex adjective in (17) derived from (16):

(16) e is [$_{AP}$ easy [$_{S'}$ COMP [$_{S}$ PRO to want [$_{S'}$ COMP [$_{S}$ PRO to try [$_{S'}$ COMP [$_{S}$ PRO to warn the police [$_{PP}$ about [$_{NP}$ your plan]]]]]]]]]

(17) easy-to-want-to-try-to-warn-the-police-about

Three bounding nodes (all S) separate about and easy in (16); yet (17) is grammatical. Thus, the contrast between (15c) and (17) cannot be accounted for in terms of the number of bounding nodes over which A has been extended.

It appears that rob in (14) is somehow prevented from undergoing reanalysis as in (15c) because it is included in the complex noun phrase your plan to rob the bank, which is an island (Ross 1967). Notice that therefore, hypothetically speaking, if successive cyclic movement were to take place by way of the intervening COMPs from the position occupied by rob to that occupied by easy, then a Subjacency violation would occur: in (14), movement from rob to the lower COMP would cross only one bounding node (S); however, subsequent movement to the higher COMP would cross two bounding nodes (NP and S) resulting in a Subjacency violation. By contrast, in (16), movement could occur from the position of about through each successive COMP to the position occupied by easy without violating Subjacency.

We can exploit this contrast to account for the ungrammaticality of (15c), in which rob is the final element of the complex adjective derived from (14). Specifically, not only is easy not accessible to rob for movement in (14), but rob is also not accessible to easy as a final element for reanalysis, where 'accessibility' is defined in terms of the Subjacency Condition:

(18) A final element Y is accessible to an adjective X for reanalysis iff:

(a) Y immediately precedes [NP, VP] or [NP, PP], and

(b) successive cyclic movement from the position of Y to the position of X would not violate Subjacency.

Using Lasnik & Uriagereka's interpretation of 'would' in (10) as a model, we note that (18) does not claim that movement takes place from the position of the final element to that of the adjective, nor that it should or could take place. It simply says, 'Pretend that an element were moved in successive cyclic fashion from the position of Y to the position of X; would a Subjacency violation occur or not?'

If it is stipulated that reanalysis is barred just in case the intended final element is not 'accessible' to the adjective, as this notion is defined in (18), then (15c) could not be derived from (14), since rob, unlike warn and about, is not accessible to easy in (14) for reanalysis. By contrast, the equally long complex adjective in (17) is possible because about in (16) is accessible to easy: successive cyclic movement from the position of the former to that of the latter would not violate Subjacency.

A couple of points should be made regarding the definition in (18).

First, consistent with (18) is the fact that the intervening variable (the material between X and Y) may itself contain one or more islands which are irrelevant for determining the accessibility of the final element, as in:

(19) easy-to-explain-your-plan-to-rob-the-bank-to

(19) incorporates the complex NP your plan to rob the bank. The infinitive rob could not be the final element in (19) for the same reason that (15c) is ungrammatical; yet as a part of the medial element which is incorporated in (19), rob is perfectly acceptable.

Secondly, I would point out that although Chomsky's definition of Accessible SUBJECT in (10) and the definition in (18) refer to two entirely different kinds of accessibility, the use of the WNV device is common to both definitions. (10) is thus viewed here as providing some independent motivation for the way in which accessibility is defined in (18). The WNV device is needed in this solution because despite the fact that reanalysis and Move-α both relate two positions X and Y across a variable and despite the fact that they both exhibit wh-island effects, they are still considered to be distinct processes, with Subjacency assumed to be a constraint on movement only--not on reanalysis. These assumptions, along with the reasonable claim that (11) is the correct D-structure underlying (1), can be maintained, provided that (18) is adopted as a way of measuring the distance between the intended first and last elements of the substring on which reanalysis is potentially operable. If these elements are 'too

far apart' in the sense of (18), then reanalysis cannot take place.

In the analysis that I am proposing, the derivation of sentence (1) from the D-structure in (11) is thus assumed to proceed as follows. First it is determined that please is accessible to easy for reanalysis:movement from the position of please (through COMP) to that of easy would not violate the Subjacency Condition. Next reanalysis is applied, resulting in the structure shown in (12). Finally, for reasons discussed below, John, now the complement of the derived complex adjective easy-to-please, moves to subject position, as in (20):

(20) John$_i$ is [$_{AP}$ [$_A$ easy to please] t_i]

Interestingly, (20) is precisely the same S-structure which Chomsky attributes to sentence (1), but now the need to insert John at S-structure has been eliminated.

Derived Adjectives as θ-role Assigners. Consider the reanalyzed structure in (12), repeated below, from which (20) is derived in this analysis:

(12) e is [$_{AP}$ [$_A$ easy to please] John]

Chomsky (1981:312) assumes (correctly, I believe) that the complement of a derived complex adjective like easy-to-please is in a θ-position. Recall, however, Jones's remark that in order to maintain this claim and also satisfy the Projection Principle, some other principle must be devised to ensure that easy-to-please θ-marks its complement in exactly the same way as the verb that it incorporates. Jones's position is understandable, if only because Chomsky fails to make clear just why it is that the complement of easy-to-please is in a θ-position. I believe that there is a reasonable explanation as to why Chomsky is correct on this point: quite simply, derived adjectives incorporating a verb are verbal adjectives, and as such, they share the θ-marking capabilities of other verbal adjectives.

One group of verbal adjectives in particular with which derived adjectives may be compared are passive participles, long recognized as behaving like adjectives for at least two reasons: 1) their inability to assign Case in English and many other languages and 2) the fact that they exhibit adjectival morphology in other languages (van Riemsdijk & Williams 1986:233).

Evidence that derived adjectives and passive participles treat their respective complements in exactly the same way is provided by facts about of-insertion, the rule by which the semantically empty preposition of is inserted before an adjective (and a noun) complement as a kind of Case-marker (Chomsky 1981:50):

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(21) a. proud John

b. proud of John

A well-known characteristic of passive participles is that the device of inserting of to assign Case to their complements is not permitted:

(22) a. e was killed John

b. *It was killed of John.

Like other adjectives in English, derived adjectives like easy-to-please are also not Case-assigners. Significantly, they behave exactly like passive participles (rather than other adjectives) with respect to the impossibility of applying of-insertion:

(23) a. e is [$_A$ easy to please] John

b. *It is easy to please of John.

The facts in (21-23) suggest that derived adjectives and passive participles belong to the same subclass of adjectives, appropriately designated as verbal adjectives. Like all adjectives, they fail to Case-mark their complements; moreover, they share the additional property of disallowing of-insertion in the expected environment (hence requiring the application of NP-movement, as discussed below). In view of the participle-like nature of derived adjectives, it is reasonable to assume that they also θ-mark their complements and that, like passive participles, in doing so they preserve the θ-marking properties of the simple active verbs with which they are associated (for example, please in easy-to-please). The position taken here, therefore, following Chomsky, is that the complement of a derived adjective is indeed in a θ-position. Moreover, this holds without the need to devise some other principle to supplement the Projection Principle, contrary to what Jones suggests.

Finally, as in the derivation of passives, tough constructions in this analysis undergo NP-movement, by which the complement of the derived adjective is moved to the empty subject position. Thus, just as (22a) becomes (24), (23a) is changed to (25):

(24) John$_i$ was killed t_i

(25) John$_i$ is [$_A$ easy to please] t_i

In both (24) and (25), the movement of John to subject position ensures that John is assigned (nominative) Case, as required by the Case Filter; and the resulting sentences are grammatical.

Summary. The solution proposed here to account for tough constructions overcomes Jones's objections to Chomsky's analysis. First, the close similarities noted above between derived adjectives and passive participles lend credence to Chomsky;s assumption, adopted here, that the subcategorization properties of verbs like please in easy-to-please are preserved at S-structure in accordance with the Projection Principle. Moreover, this is so despite the obvious change in status that the direct object incurs as a result of having undergone reanalysis. Second, this solution obviates the need to insert John at S-structure (Chomsky's approach) rather than D-structure, thus allowing for the existence of more complex subjects like those in (6). The subject of tough constructions is claimed here to originate in object position at D-structure. Consequently, it may be complex, as in (6); it may be a transformationally derived structure, as in (7); and once NP-movement is applied, it may subsequently be moved, as in (8).

To provide further motivation for this analysis, I now turn to a related phenomenon, tough constructions that allow a parasitic gap. Chomsky (1982) has used such sentences to argue for the need to apply wh-movement in tough constructions. However, it is demonstrated below that there is an equally plausible analysis of these sentences in which the object NP undergoes Heavy NP Shift instead of Movement-to-COMP. This being the case, it is concluded that parasitic gaps can no longer be used to justify the need for a Movement-to-COMP analysis of tough constructions.

6. Parasitic Gaps in Tough Constructions

wh-movement Constructions. Chomsky (1982) has argued that parasitic gaps are licensed by the trace of Movement-to-COMP. Thus, in each of the following sentences the parasitic gap e is licensed by the wh-trace t:[10]

(26) a. Which articles did John file t without reading e

b. This is the kind of food you must cook t before you eat e

As illustrated in (27), the licensing trace cannot be an NP-trace:

(27) *The articles were filed t without reading e

These facts lead Chomsky to state the environment in which a parasitic gap can occur as

(28) ...α...t...e... (order irrelevant)

where α in (28) locally A'-binds t (1982:40). In (26a), t is locally A'-bound by which articles in COMP. Likewise, in (26b), the null operator that has moved to COMP in the relative clause locally A'-binds t. In (27), however, t is A-bound by the articles in subject position; thus, the parasitic gap in (27) is not permitted.

Tough Constructions and Dual S-structure Representations. Tough constructions, like wh-movement constructions, appear to allow a parasitic gap:

(29) The book is hard to buy without reading.

Accordingly, Chomsky represents the S-structure of sentence (29) as in (30):

(30) The book is hard to buy t without reading e

Following the environment specified in (28), the parasitic gap e in (30) appears to be licensed by t, which is presumably the wh-trace that results from Movement-to-COMP.

Clearly, though, if e in (30) is a parasitic gap, as Chomsky claims, then his analysis of tough constructions as outlined in Section 1 runs into yet more difficulties. The problem here is that in his analysis t in (30) is claimed to be an NP-trace, locally A-bound by the book in subject position--and not a wh-trace as (28) requires. This is so because in his solution the wh-trace created by Movement-to-COMP is converted into an NP-trace by reanalysis. Thus, contrary to what Chomsky would prefer, his analysis of tough constructions does not allow the parasitic gap in (30).

Chomsky immediately recognizes this problem; and to accommodate (30), he proposes

> an interpretation of reanalysis that assumes both the reanalyzed and the nonreanalyzed structures to be available at S-structure. This is entirely feasible, if we regard phrase markers as sets of strings rather than tree-like structures ... the implications seem worth pursuing, but I shall not do so here (1982:57).

In Chomsky's analysis of tough constructions, the nonreanalyzed structure in the derivation of (29) is the representation shown in (31):

(31) e is $[_{AP}$ hard $[_{S'}$ PRO_i $[_S$ PRO to buy t_i without reading e]]]

t in (31) is the wh-trace created by the movement of PRO to COMP. If both (30) and (31) are assumed to be available at S-structure, as Chomsky proposes, then supposedly t can be interpreted as a wh-trace (in (31)) for the sake of licensing the parasitic gap and, simultaneously, as an NP-trace (in (30)) so that the tough subject (the book), inserted at S-structure in his analysis, does not violate the θ-criterion (see Section 1).

Although Chomsky does not say so, his proposal might be regarded as global in the sense of 'looking back' to an earlier stage in the derivation (Levine 1984b:21-2). Technically, though, this depends on whether (31) is taken to be an earlier structure (a 'preanalyzed' structure) or, as Chomsky apparently intends, as one of two coexisting S-structures.[11] If the latter is assumed, then one might not object to the way in which Chomsky extends his analysis to account for sentences like (29)—were his analysis of tough constructions not problematic to begin with. It has been shown, however, that Chomsky's solution is inadequate when Jones's counterexamples in (6-8) are taken into account. To overcome these difficulties, an alternative analysis has been proposed in which the tough subject is claimed to be inserted in embedded object position at D-structure (instead of matrix subject position at S-structure, as Chomsky assumes). In order to maintain the present solution, it must be demonstrated that Movement-to-COMP is not needed to account for the parasitic gap in (29). In what follows I show that although this gap is licensed in accordance with the environment specified in (28), Movement-to-COMP is not involved in the derivation of (29).

Analysis and Discussion. In this solution the D-structure underlying (29) is represented in (32):

(32) e is $[_{AP}$ hard $[_{S'}$ $[_{S}$ PRO to buy the book $[_{PP}$ without $[_{S'}$ $[_{S}$ PRO reading e]]]]]]

In order for the parasitic gap e to be licensed in accordance with (28), the book must move to a non-argument position (for instance, COMP), leaving a trace t which is locally A'-bound. It has already been shown, though, that if the book were moved to COMP and then on to matrix subject position, the variable t left behind in its original position would be A-bound by the book in violation of Binding Condition C (cf. the discussion (13)). Thus, sentence (29) cannot be derived from (32) by Movement-to-COMP.

COMP is not the only non-argument position to which the book can move, however. To see this, consider the following sentence which has undergone Heavy NP Shift (Engdahl 1983:12):

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(33) John offended t by not recognizing e immediately, his favorite uncle from Cleveland.

In sentences like (33), the parasitic gap e is licensed by the trace t of the moved NP. Following Groos & Bok-Bennema (1985:78), I assume that in (33) NP is adjoined to matrix VP where it A'-binds t.

Heavy NP Shift can also occur in the S' complement of an adjective, as in (34):

(34) It is easy for John to offend t by not recognizing e immediately, his favorite uncle from Cleveland.

Now compare (34) with its abbreviated version in (35):

(35) It is easy for John to offend t by not recognizing e immediately, his uncle.

(35) is not as good as (34), stylistically anyway, because his uncle is not felt to be 'heavy enough'; yet, as Chomsky (1982:67-8) observes, the notion 'heaviness' cannot be expressed within core grammar. Indeed, within the framework of core grammar, Heavy NP Shift is assumed to be applicable to 'light' NP's (for instance, his uncle) as well as 'heavy' ones; and both (34) and (35) are syntactically well-formed.

Suppose that the book in (32) undergoes Heavy NP Shift producing the intermediate string shown in (36):

(36) e is $[_{AP}$ hard $[_{S'}$ $[_{S}$ PRO to $[_{VP}$ $[_{VP}$ buy t_i $[_{PP}$ without $[_{S'}$ $[_{S}$ PRO reading $e_i]]]]]$ the book$_i]]]]$

In (36) the book has been moved to the end of VP (of which buy is the head) and adjoined to VP, leaving a trace t in its original position. t is locally A'-bound by the book, and the parasitic gap e is licensed by t in accordance with (28).

Reanalysis can occur in three different ways in (36), depending on whether buy, reading, or the parasitic gap e is taken to be the final element. All three elements are 'accessible' to the adjective for reanalysis, as this notion is defined in (18). Thus, consider the three possible reanalyzed structures shown in (37):

(37) a. e is $[_{AP}$ $[_{A}$ hard to buy$]$ t_i $[_{PP}$ without $[_{S'}$ $[_{S}$ PRO reading $e_i]]]$ the book$_i]$

b. e is $[_{AP}$ $[_{A}$ hard to buy without reading] e_i the book$_i$]

c. e is $[_{AP}$ $[_{A}$ hard to buy without reading] the book$_i$]

Notice that in all three structures in (37), the book has become a derived complement of the complex adjective following the elimination of S' and its internal constituents--including both of the VP's which are labeled in (36). Note also that, as in Chomsky's analysis, empty categories (for instance, PRO) which are incorporated into the complex adjective are assumed to be erased in the process; thus, t does not appear in (37b-c), and e is absent in (37c).

Applying NP-movement to (37a-c) results in the S-structures represented in (38a-c) respectively:

(38) a. the book$_i$ is $[_{AP}$ $[_{A}$ hard to buy] t'$_i$ $[_{PP}$ without $[_{S'}$ $[_{S}$ PRO reading e_i]]]] t_i]

b. the book$_i$ is $[_{AP}$ $[_{A}$ hard to buy without reading] e_i t_i]

c. the book$_i$ is $[_{AP}$ $[_{A}$ hard to buy without reading] t_i]

(38a) is not a well formed S-structure, because NP-movement results in a chain (the book$_i$, t'$_i$, t$_i$) which has two θ-positions: both traces are complements of hard-to-buy in (38a) and thus occupy two θ-positions.[12] (38a) also violates the θ-criterion since hard-to-buy presumably has only one θ-role to assign. Similarly, in (38b), if the parasitic gap e$_i$ is included in the chain (the book$_i$, e$_i$, t$_i$), then this chain has two θ-positions and is thus ill-formed. On the other hand, if e$_i$ is not taken to be a part of this chain, then it cannot receive a θ-role because it is neither in a Case-marked position nor linked to such a position and is therefore not visible for θ-marking. By contrast, the chain (the book$_i$, t$_i$) in (38c) is well-formed. I therefore take (38c) to be the correct S-structure representation for the sentence in (29).

As in Chomsky's solution, I assume that both (38c) and the nonreanalyzed structure in (36) are available for interpretation at S-structure, the latter containing the licensed parasitic gap. Thus, this analysis provides a principled account of parasitic gaps in tough constructions; and it has the additional advantage of permitting the insertion of the tough subject in embedded object position at D-structure. The strongest argument for preferring this analysis is therefore the same one given in Section 5: unlike Chomsky's Movement-to-COMP analysis, this solution adequately accounts for Jones's counterexamples in (6-8). On these

grounds alone, Chomsky's account of tough constructions must be rejected in favor of the alternative solution offered in this study.

7. Tough Movement in GB Theory

Hidden among the scores of notes in Lectures are Chomsky's reflections on the potential implications of earlier work for developing the correct theory of grammar:

> It is worth noting that as theories of grammar have become more restrictive over the years, thus enhancing explanatory depth in some domains, certain topics that had received a suggestive and sometimes illuminating analysis in terms of less constrained theories have in effect been abandoned ... But one should, I think, bear in mind the more interesting possibilities explored in earlier work ... with an eye toward the possibility of recapturing earlier explanatory options that may express genuine insights that have been lost (1981:316, fn 6).

I believe that one 'illuminating analysis' to which Chomsky might be referring is the so-called 'standard' approach to describing tough constructions in transformational grammar. Under this approach, first suggested in Chomsky (1964:61-5) and later formalized as a transformation in Rosenbaum (1967:107). sentence (40) is the result of raising the object of the embedded verb in (39) to the matrix subject position:

(39) It is tough for John to shave Bill.

(40) Bill is tough for John to shave.

Known as Object to Subject Raising--or, equivalently, Tough Movement--this rule provides an explanation for the fact that Bill in (40) is the understood object of shave.

While Object to Subject Raising is accepted in other models,[13] it is not allowed in GB theory because the NP-trace created in the process violates Binding Condition A (Lasnik & Uriagereka 1988:147). To illustrate, the structure shown in (41) is derived from (11) by Object to Subject Raising:

(41) $John_i$ is $[_{AP}$ easy $[_{S'}$ $[_S$ PRO to please $t_i]]]$

The trace of NP-movement, an anaphor, is subject to Condition A. Yet t_i in (41) is free in its governing category (the lower S).

Notice, though, that this problem does not arise in the present analysis, in which (11) undergoes reanalysis prior to NP-movement. Once NP-movement is applied, the resulting NP-trace in (20), repeated below, is bound (by John) in its governing category (S) as Condition A requires:

(20) $John_i$ is $[_{AP}$ $[_{A}$ easy to please] $t_i]$

I observed earlier that the well-formed S-structure in (20) is identical to the one derived in Chomsky's analysis. However, the solution proposed here, in which (20) is derived from (11) (rather than (2)), is made more appealing by its success in recapturing the spirit, if not the letter, of Chomsky's (1964) earlier insight concerning tough constructions. Like the Tough Movement rule, once held to be extremely well motivated, this analysis correctly ascribes to the tough subject the underlying status of direct object--and it does so once and for all in keeping with the principles of GB theory, including Binding Condition A. These favorable results enhance the credibility of the present analysis and of GB theory itself, and they point up the validity of Chomsky's suggestion that earlier linguistic insights cannot be ignored.

8. Conclusion

The present solution is essentially a GB version of the 'standard' Tough Movement analysis. Within the current framework, Tough Movement is assumed here to be a typical instance of NP-movement (Move-α), which is applied to the derived complement of a reanalyzed structure. The reanalysis rule itself is adopted from Chomsky's (1981) analysis. Also adopted here is Chomsky's assumption that the complement resulting from reanalysis is in a θ-position--as I have argued, just like the complement of a passive participle.

The main differences between Chomsky's analysis and this solution stem from a disagreement as to whether Movement-to-COMP is needed to account for wh-island effects and parasitic gaps in tough constructions. With respect to the former, it has been suggested that the intended final element of a complex adjective must be 'accessible' to the adjective for reanalysis, where 'accessibility' is defined in terms of the Subjacency Condition. This proposal utilizes the would not violate device which Chomsky introduces in his definition of Accessible SUBJECT in binding theory, in this case allowing Subjacency to be used as a measuring stick with no actual movement taking place within the substring on which reanalysis operates. If this solution is correct, then Movement-to-COMP is not needed to account for wh-island effects in the complex adjective of a tough construction. As to parasitic gaps, which are known to be licensed by wh-trace, it has been shown that the licensing trace can be produces without Movement-to-COMP, if the embedded object undergoes Heavy NP Shift, an option which core

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grammar makes available. It is concluded, therefore, that parasitic gaps can no longer be used to justify the need for a Movement-to-COMP analysis of tough constructions.

To maintain his Movement-to-COMP analysis, Chomsky is forced to claim that the tough subject is inserted in matrix subject position at S-structure, a proposal which leads to a more powerful theory with the reintroduction of generalized transformations. However, if the alternative solution offered in this study is correct, then Chomsky's proposed measure is simply not needed in GB theory to account for tough phenomena. The implications of this analysis are therefore very much in keeping with Chomsky's own efforts to develop a maximally constrained theory of grammar.

NOTES

[1] I am indebted to Zeljko Boskovic, Ahmed Fakhri, Frank Medley, Johan Seynnaeve, and Stan Whitley for their helpful comments on an earlier draft of this paper.

[2] The θ-criterion is stated as follows: 'Each argument bears one and only one θ-role, and each θ-role is assigned to one and only one argument' (Chomsky 1981:36).

[3] wh-movement is subject to the Subjacency Condition, which prohibits the movement of a constituent across more than one bounding node (S or NP). In Chomsky's analysis, the application of wh-movement in (3a-b) crosses two bounding nodes, hence the sentences are ungrammatical. (For a detailed discussion of the Subjacency Condition, see Chomsky 1977.)

[4] I limit the present discussion to Jones's main theoretical arguments against Chomsky's proposals which lead Jones to reject the entire Government-Binding framework as a viable theory of grammar. Jones also raises a number of objects to Chomsky's analysis on empirical grounds, arguing that there is no evidence to support Chomsky's claim that wh-movement is involved in tough constructions, apart from the fact that they appear to obey the wh-island conditions. I disagree with Jones on this point, which boils down to the familiar question of how much evidence is enough. Suffice it to say that the wh-like properties of tough constructions, for instance, those illustrated in (3), must be accounted for in some way. Chomsky's approach to doing this, while inadequate for the reasons discussed below, is certainly not empirically unjustified, contrary

to what Jones suggests.

[5] According to the Projection Principle, 'representations at each syntactic level (i.e., LF, and D- and S-structure) are projected from the lexicon, in that they observe the subcategorization properties of lexical items' (Chomsky 1981:29). Chomsky (30-1) observes that the essentials of trace theory follow from the Projection Principle and therefore need not be stipulated independently.

[6] The example in (6b) appears in Lasnik & Uriagereka (1988:47) and is attributed to Kevin Kearney.

[7] Chomsky (1981:188) states the Binding Conditions as follows:

(A) An anaphor is bound in its governing category.

(B) A pronominal is free in its governing category.

(C) An R-expression is free.

[8] Levine (1984a, 1984b) presents several arguments against reanalysis rules, including the rule adopted here from Chomsky (1981). Levine's examples, many involving Right Node Raising constructions of the form

(i) John is difficult, and Marjorie (is) impossible, to please.

raise questions about the internal constituency of complex lexical items for which I have no immediate answer. However, Levine does not propose a solution to replace the reanalysis rules which he considers; and consequently his position that such rules should be abandoned in grammatical theory is, at best, tenuous. I assume, therefore, that reanalysis is still an available (albeit controversial) device within the current model; and I adopt Chomsky's reanalysis rule as a working hypothesis. If the present solution turns out to be correct, then it can be used to argue in favor of allowing such rules in the theory.

[9] The condition that A cannot be extended across more than one bounding node may be needed for Spanish, however. According to Montalbetti & Saito (1983: 192), Spanish does not allow the so-called unbounded tough construction. The authors give the example shown in (i) (cf. the grammatical sentence in (ii)):

(i) *Este libro es facil de decirle a los ninos de leer.
'This book is easy to tell the kids to read.'

(ii) Este libro es facil de leer.

'This book is easy to read.'

[10] Many of Chomsky's examples of parasitic gap constructions, including those in (26), are taken from Engdahl (1983).

[11] For further discussion of Chomsky's proposal, see Montalbetti & Saito (1983:192). The authors assume that tough constructions in Spanish (as well as English) have dual representations at S-structure.

[12] Chomsky (1986:93) notes that complements of a head always occupy θ-positions. Thus, given the requirement that a chain has at most one θ-position (Chomsky 1986:135), it follows that a chain cannot contain two complements of a head, the situation represented in (38a).

[13] In particular, recent work in relational grammar has focused on Object to Subject Raising (see, for instance, Gonzalez 1985, 1988).

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